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THE PEACE CORPS EDUCATIONAL TELEVISION (ETV) PROJECT IN COLOMBIA--TWO YEARS OF RESEARCH. RESEARCH REPORT NO. 3, IMPROVING THE EFFECTIVENESS OF THE UTILIZATION VOLUNTEER AND THE UTILIZATION OF ETV BY THE COLOMBIAN TEACHER.

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THIS EXPERIMENT IN THE ETV PROJECT SHOWED THE SUPERIORITY OF PUPIL PRACTICE AS A TEACHING METHOD AND STUDIED THE EFFECTIVENESS OF THE UTILIZATION VOLUNTEER (A PEACE CORPS VOLUNTEER CONCERNED WITH IMPLEMENTING ETV IN THE SCHOOLS) IN DIFFERENT SITUATIONS. THREE TREATMENTS WERE ARRANGED--(1) ACTIVE PUPIL PRACTICE WHERE BROADCASTS WERE COMBINED WITH UNIFORM "MOTIVATION" AND "FOLLOW-UP" BY THE TEACHER, (2) EXPOSITORY, WITH THE SAME CONTENT AS (1), BUT WHERE STUDENTS GOT NO OPPORTUNITY TO RESPOND, AND (3) AD HOC, WHERE TEACHERS USED THEIR OWN METHODS. TREATMENTS (1) AND (2) WERE GUIDED AND SUPERVISED BY VOLUNTEERS. AFTER EIGHT TELECASTS ABOUT 800 STUDENTS WERE GIVEN ACHIEVEMENT TESTS. ACTIVE PUPIL PRACTICE TEST SCORES WERE SUPERIOR TO THOSE OF THE AD HOC GROUP, AND HIGHER COMPARED TO THE EXPOSITORY CONDITION, ALTHOUGH NOT SIGNIFICANTLY HIGHER. NO SYSTEMATIC DIFFERENCES WERE DISCERNIBLE BETWEEN EXPOSITORY AND AD HOC SCORES. IMPLICATIONS FOR TEACHING TECHNIQUES ARE DISCUSSED. (OH)

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THE PEACE CORPS EDUCATIONAL TELEVISION (ETV) PROJECT IN COLOMBIA -- TWO YEARS OF RESEARCH.

Research Report No. 3:

Improving the Effectiveness of the Utilization Volunteer and the Utilization of ETV by the Colombian Teacher.

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Institute for Communication Research
Stanford University
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During the second semester (July-November, 1965) of the Peace Corps Educational Television (ETV) Project in Colombia, one of the major research activities was an experiment comparing the instructional effectiveness of several teaching techniques which classroom teachers might use to complement the televised instruction. How could the "motivation" and "follow-up" (the instruction provided by the classroom teacher immediately before and after each televised lesson) of the classroom teacher be improved? It was in search of an answer to this question that this research was conducted.

The Background: During interviews conducted at the end of the ETV Project's first semester, many utilization Volunteers reported that they felt hampered by a lack of knowledge of teaching methods. These Volunteers said they wished they could tell their teachers more exactly what a teacher using television should do in class to increase learning from television.[1] It was also clear that the teachers were highly dependent on the Teacher Guides (advance outlines of the telecasts which include suggestions for complementary in-class instruction). Frequently, however, the teachers complained of inadequacies in the Guides and lack of coordination between the Guide material and the

programs.[2] And the teachers seemed to have a case: When the researchers tried to use the Guides as a basis for writing test items on course content, or to outline possible "motivations" (the in-class presentations preceding each telecast) or "follow-ups" (the in-class presentations following each telecast), it proved surprisingly difficult -- primarily because of a lack of concreteness and specificity in the Guides. Moreover, the results of the field experiment concerned with the effects of the televised instruction and the work of the utilization Volunteer conducted during the project's first semester had failed to show the achievements in pupil learning attributable to the Volunteer utilization program that had been hoped for. For these reasons then, utilization in the classroom seemed to demand attention: a) the expressed need of Volunteers for some guidance as to the specific instruction they should provide teachers; b) the inadequacies of the Guide material then being received by teachers; and, c) the failure of the Volunteer utilization program as it had evolved during the first semester to have a markedly positive effect on pupil learning. The consequence was the design of an experiment involving: a) different, feasible techniques for "motivations" and "follow-ups" which the utilization Volunteer might encourage the teacher to employ, and b) special, more specific material for "motivations" and follow-ups" which might serve as a basis for the form of future Guide content.

The problem, then, was to develop a pattern for utilization that would be more successful in increasing the effectiveness of the televised instruction. A whole series of researches done mostly in

quasi-laboratory settings and in American school classes suggests the following:[3] When the demonstration of material to be learned -- from television, teaching machine, or live teacher -- is accompanied by appropriate patterns of active student practice of the content to be learned, learning efficiency is increased. Of the various patterns of combining such demonstration and practice, the method of providing students with knowledge of the correct response has proved to be a highly effective one.[4] The question, then, became: Could such methods be adapted to the Peace Corps ETV Project in Colombia? The following experiment was an attempt to do just that.

The Experiment: Pupils were exposed to instruction under three conditions. These can be designated: 1) Active Pupil Practice, 2) Expository, and 3) Ad Hoc utilization.[5] All three involved complementary television activity which either could be readily adopted, or indeed was already being used. The telecasts, which carried the core of the instruction, were the same for all three conditions.

In Active Pupil Practice utilization, the teacher presented the "motivation" and "follow-up" in the form of questions; pupil behavior was guided by instructing the pupils to answer the questions individually; and opportunity for practice of the correct response was provided by giving the correct answer immediately after the pupil's initial response.

In Expository utilization, the teacher presented the same content material in her "motivation" and "follow-up", but the presentation was in the form of statements, or a lecture, and pupil behavior was restricted by giving the pupils no opportunity to respond, thus making active practice of the correct response less likely.

In both Active Pupil Practice and Expository utilization, the material presented by the teacher was carefully coordinated with the television programs. Special outlines or "scripts" for each "motivation" and "follow-up" were prepared by a representative of the Colombian National Ministry of Education in cooperation with the television teachers and Guide writers. The classroom teachers also received, in addition to briefings on the two techniques from Volunteers, written instructions. These instructions, and examples of the special outlines for "motivation" and "follow-up" appear in the Appendix. In Ad Hoc utilization, the teacher presented her motivation and follow-up using the usual Guide material and whatever techniques she had developed. All teachers knew their classes were to be given some sort of test as part of a study of teaching methods. In all three methods, Volunteer contact with the teacher was identical.[6]

To many of the Colombian teachers, the Expository condition seemed radically inferior to their usual methods because it eliminated rote oral response by the class of key words under the teacher's guidance. However, for research purposes it was necessary to have a condition which provided students with exactly the same information as in the Active Pupil Practice condition, but which at the same time sharply reduced the opportunity for active pupil practice.

The Theory: The working hypothesis from which the conditions were developed was simply that the theory applicable to instructing with visual demonstrations is applicable to elementary grade ETV, because the telecasts are analogous to demonstrations. The three relevant

learning-from-demonstration propositions are:

1) Added exposure to the material to be learned increases learning;

2) Practice by the learner of the content to be learned increases learning;

3) Feedback of knowledge of the correct response to the learner increases learning.

The experimental schema was as follows:

Relevant propositions:	(1)	(2 & 3)
Experimental Condition:	Televised Presentation Supplemented By Teacher	Feedback and Pupil Practice Added By Teacher
1) Active Pupil Practice	+ +	+ +
2) Expository	+ +	____
3) Ad Hoc utilization	+ ?	+ ?

On the basis of the propositions, the following hypotheses were advanced:

a) Active Pupil Practice would prove superior to Ad Hoc utilization, because of 1) insured exposure to relevant material, 2) feedback as to correct and incorrect responses, and 3) active practice.

b) Active Pupil Practice would prove superior to Expository utilization because of 1) feedback as to correct and incorrect responses, and 2) active practice.

No hypothesis was advanced as to the relationship between Expository and Ad Hoc utilization. As the product of teacher ingenuity, aided by Volunteer help and the Guides, the teacher's behavior in Ad Hoc

utilization was uncontrolled. To a greater or lesser degree, depending on the skill of the teacher, some practice was likely. The Expository utilization classes were insured of receiving "motivations" and "follow-ups" with instructional content relevant to the telecasts, but because of the limited time available before and after the telecasts, this insured exposure prohibited whatever practice might ordinarily occur. In this situation, the Expository classes provided not only a) a standard for evaluating the performance of the Active Pupil Practice classes, but b) an empirical test (although on a very small sample) of the efficacy of the kind of pupil activity commonly encouraged.

Pre-Test of Manipulations: The Active Pupil Practice and Expository utilization techniques were pre-tested for feasibility and effectiveness in a two week period in late July, using Mathematics V and Natural Sciences III. Eight teachers in Bogota, two for each subject and experimental condition, were indoctrinated in the special techniques by Volunteers, and before and after two televised lessons conducted "motivations" and"follow-ups" in the prescribed manner. At the end of this brief period, tests over the televised content were administered in these classes under Volunteer supervision, and in other classes which had received uncontrolled (or Ad Hoc) "motivations" and "follow-ups". The results indicated that teachers could and would comply, and that Active Pupil Practice showed promise of its expected superiority.

The Design: Two courses were chosen for the actual experiment, Natural Science IV and Mathematics V. These particular courses were selected on several grounds: a) that first or second grade courses should not be used, because of greater difficulty in constructing

acceptable tests and insuring adequate testing conditions for very young children; b) that the number of courses should be limited to two, to insure adequate control over experimental conditions and materials; c) that courses representing different grades should be used; d) that the televised instruction should be the best possible, and therefore courses in which ETV had enhanced pupil achievement as measured in the field investigation of the previous semester should be used; and, e) that courses should be used for which ready cooperation from the Colombian television teachers and Guide writers seemed likely. Natural Science IV and Mathematics V met these criteria.

Six utilization Volunteers agreed to supervise teachers whose behavior in class was to constitute the independent variable, with each Volunteer providing one Active Pupil Practice, one Expository, and one Ad Hoc utilization class for each of the two courses. This design made a single Volunteer responsible for one class in each condition for each course, so that the effects of variations in Volunteer skills would not be reflected unevenly in the various conditions, thereby distorting results. For the same reason, the classes in each condition for each course were matched as to teacher skill and pupil aptitude, on the basis of Volunteer reports, so as to be as alike as possible. Parallel work was conducted with teachers using ETV for the first time in Ibagué (Tolima), and with teachers who had had a full semester's experience with ETV, in Bogotá (Cundinamarca). Thus, three Ibague Volunteers provided 18 classes, and three Bogota Volunteers provided 18 classes. Sex of pupils was kept the same for conditions to be compared,

to prevent distortion of results by differential aptitude for the subjects. The design matrix is shown in Figure 3:1. The teachers used the experimental "motivation" and "follow-up" procedures over a period of four

Figure 3:1: Utilization Experiment: Design Matrix

In Ibagué: In Bogotá:

Subject:	Condition:	PCV No: 1	2	3	4	5	6	Classes:
Natural Science IV	Active Pupil Practice							= 6
	Expository							6
	Ad Hoc							6
Mathe-Matics V	Active Pupil Practice							6
	Expository							6
	Ad Hoc							6
		6	6	6	6	6	6 = 36 Classes	

weeks, or eight telecasts.[8] At the end of the period, during the week of Oct. 19-23, 1965, tests were administered under Volunteer supervision to the classes.

The Tests: The criterion for Mathematics V was a 21-item test. The criterion for Natural Science IV was a 40-item test. Both tests were constructed on the basis of results of a pre-testing of possible items -- 80 for Natural Science IV and 100 for Mathematics V. These trial tests were administered by Volunteers to various Bogota ETV classes

not included in the experimental design: approximately 150 responses to each item were obtained. This pre-test was conducted two weeks before the scheduled final exams, and the tests were immediately scored and analyzed. Easy items were eliminated, and ambiguous items either eliminated or revised. The principal goal was to construct tests requiring no more than 50-minute class session to complete and sufficiently difficult so that differences in achievement could be reflected. The pre-test items were prepared by the Colombian television teachers and Guide writers and the representative of the Ministry of Education.

Results: On the 36 classes originally included in the design matrix, scores were obtained for 29.[9] The results are shown in Table 3:1. The mean of each class is treated as the score for that class, and the mean of all class means within a condition as the score for that condition. Altogether, the tests of about 800 pupils are represented in the results; all the classes were about the same size; the average class size was 30. Statistical significance of differences was subjected to t-test.[10]

For both Natural Science IV and Mathematics V, the performance of the classes in the Active Pupil Practice condition was superior to that of the classes in the Ad Hoc utilization condition. For Natural Science IV, the Active Pupil Practice mean was 19.61 versus an Ad Hoc utilization mean of 16.10 ($P. < .005$). For Mathematics V, the Active Pupil Practice mean was 11.58 versus an Ad Hoc utilization mean of 9.38 ($P. < .05$). As indicated, both differences were significant statistically.

No other overall differences attained the arbitrary criterion of the .05 level of statistical significance.

Table 3:1 Three Kinds of Utilization: Mean Class Scores by Course, Site, and Experimental Condition.

Condition:	Ibague		Bogota			
	NS IV	M V	NS IV	M V	NS IV	M V
Active Pupil Practice	14.84	8.80	20.89	11.44	19.61	11.58
	21.10	11.20	24.71	12.44	(5)	(5)
	16.50	14.00	22.80 (2)	11.94 (2)		
	17.48 (3)	11.33 (3)				
Expository	19.46	10.53	21.62	8.33		
	16.66	6.14	16.07	8.02	17.80	9.11
	15.25	12.52	18.84 (2)	8.17 (2)	(5)	(5)
	17.12 (3)	9.66 (3)				
Ad Hoc	15.25	8.57	16.74	10.59		
	14.91	8.81	17.48	11.07	16.10	9.38
	15.08 (2)	7.88	17.11 (2)	10.83 (2)	(4)	(4)
		8.42 (3)				

NS IV: Active Pupil Practice (19.61)>
Ad Hoc (16.10) (P. < .005)*
Active Pupil Practice (19.61)>
(17.80) (P. < .25) *

MV: Active Pupil Practice (11.58)>
Ad Hoc (9.38) (P. < .05) *
Active Pupil Practice (11.58)>
Expository (9.11) (P. < .06) *

* t-test, one-tailed.

For Mathematics V, the Active Pupil Practice mean of 11.58 was greater than the Expository mean of 9.11 (P. < .06). For Natural Science IV, the Active Pupil Practice mean of 19.61 was greater than the Expository mean of 17.80 (P. < .25), but the difference, although in the expected direction, did not reach statistical significance.

The consistency of the individual results can be seen easily in Table 3:2, in which each score is presented as a deviation above or

Table 3:2: Three Kinds of Utilization: Deviations of Class Means Above or Below Mean in Subject for Testing Site.

Condition:	Ibagué NS IV	Ibagué M V	Bogotá NS IV	Bogotá M V
Active Pupil Practice	- 1.91 + 4.30 - 0.25	- 1.03 + 1.37 + 4.17	+ 1.30 + 5.11	+ 1.13 + 2.12
Expository	+ 2.71 - 0.09 - 1.50	+ 0.70 - 3.69 + 2.69	+ 2.03 - 3.52	- 1.99 - 2.30
Ad Hoc	- 1.50 - 1.04	- 1.26 - 1.02 - 1.95	- 2.85 - 2.11	+ 0.27 + 0.75

Table 3:3. Three Kinds of Utilization: Distribution of Pluses and Minuses of Class Means Above and Below Mean in Subject for Testing Site.

Condition:	Above the Mean	Below the Mean		
Active Pupil Practice	7	3	=	10
Expository	4	6	=	10
Ad Hoc	2	7	=	9
Total	13	16		29

below the mean for the course and experimental site (Ibague or Bogota). The number of pluses, or better scores, is most frequent for the Active Pupil Practice and least frequent for the Ad Hoc, with Expository utilization falling in between, as is shown in Table 3:3.

The small number of cases make differences between conditions for courses within testing sites unprofitable to examine separately. It should probably be added that the small numerical differences and low scores are the result of the difficulty and length of the tests (they were hard and relatively short). With somewhat easier tests, scores would be higher; with longer tests, differences would be greater. Furthermore, if the application of the Active Pupil Practice method were to be made over a longer period of time, such as a whole semester, the relative superiority of this method might well prove considerably enhanced.

Summary and Discussion

In this experiment, the instructional effectiveness of three different kinds of utilization of televised lessons by the classroom teacher (his "motivation" and "follow-up") were compared. The classes of 29 teachers of Natural Science IV and Mathematics V, with about 800 pupils, were the subjects. For teachers in two conditions (Active Pupil Practice and Expository utilization) special written instructions and outlines or "scripts" for utilization were provided; teachers in the third condition (Ad Hoc utilization) conducted utilization on the basis of the ordinary Teacher Guide material. In all conditions, teachers were coached and advised by utilization Volunteers. After four weeks, or eight telecasts in each subject, tests on the lesson content were administered to the pupils under Volunteer supervision.

Two principal hypotheses were advanced:

a) Active Pupil Practice would prove superior to Ad Hoc utilization, because of the insured a) exposure to course material, b) feedback as to correct and incorrect responses, and c) active practice of the material to be learned.

b) Active Pupil Practice would prove superior to Expository utilization because of insured a) feedback as to correct and incorrect responses, and b)active practice of the material to be learned.

No hypothesis was advanced as to the relative effects of Expository and Ad Hoc utilization, because the former insured exposure while restricting feedback and practice, while the latter permitted feedback and practice (if the teacher were skillful) at the possible expense of exposure to the material. However, precisely because of this, a modest (because based on a small sample) test of the effectiveness of the commonly induced kind of pupil response -- chanting of memorized material to cues provided by the teacher -- was made possible.

The results:

1) Active Pupil Practice pupil test scores were superior to those of Ad Hoc utilization for both Natural Science IV ($P. < .005$) and Mathematics V ($P. < .05$).

2) Active Pupil Practice pupil test scores were higher than those of Expository utilization, although the statistical criterion of the .05 level was not reached (for Natural Science IV, $P. < .06$; for Mathematics V, the results were in the expected direction, $P. < .25$).

3) The pattern of the results was the same both for teachers with a previous semester's experience in evolving utilization procedures

(in Bogota), and for teachers using ETV for the first time (in Ibague).

4) No systematic differences were discernible between Expository and Ad Hoc utilization pupil test scores.

Thus, one of the hypotheses (predicting the superiority of Active Pupil Practice over Ad Hoc utilization) received strong support, and one (predicting the superiority of Active Pupil Practice over Expository utilization) received mild, although not clear support.

What do these findings mean? They would seem to indicate the following:

1) The classroom effectiveness of teachers can be improved through simple changes in their teaching techniques.

2) The changes required involve at the hand of the classroom teacher, increased exposure to relevant material, feedback to pupils as to correct and incorrect learning, and active practice by pupils of the material to be learned.

3) These changes can be implemented with equal effectiveness with teachers who have already developed "styles" or techniques of utilization and with teachers who are relatively new to the utilization of ETV.

4) The changes can be induced, if appropriate printed materials are provided through coaching by utilization Volunteers.

5) The kind of pupil response customarily provided is relatively ineffective, since pupils with it did no better than those who were merely passively exposed to the material.

The kind of material used to guide the teachers in the Active Pupil Practice (and in the Expository) conditions requires a special note. It was quite specific. It certainly did not permit the teacher a great deal of freedom in choosing her own technique or approach. It certainly would not satisfy a creative teacher. However, as Beeby points out in his theory of educational progress for developing nations, teachers who lack a sound general education and who have had only a small amount of specialized training for their jobs, are frequently able to employ new techniques only if the procedures are carefully spelled out. If the teacher is left on his own, he may revert, in desperation, to the most hackneyed of techniques.[11] It is likely that some very specific material should be provided for some televised lessons in the Teacher Guides to assist such teachers. Not only might some instruction be improved, but these teachers would be practicing a technique which they later might be able to apply on their own, when less specific guidance is available.

It should be emphasized that the heart of the Active Pupil Practice condition is just that -- active practice by the pupil of the material to be learned. Feedback is necessary, and unavoidably intertwined with it, to insure that what is practiced is indeed what should be learned. The use of a question-and-answer exchange is merely a form by which practice is brought about.

It might be thought that these results apply only to the learning of facts or skills. Although such learning is important in any curriculum, and especially so in one in which there is reason to suspect that as much of it as might be possible does not occur, active pupil

practice is equally important for the learning of concepts and for the ability to draw inferences from the general to the specific, and from the specific to the general. In short, it is equally important in learning how to think. The child who practices thinking, and receives feedback as to whether he is on the right track, surely learns to do so better than the child who is merely told how to think.

FOOTNOTES

[1]See Report No. 2: Pupil Learning and Volunteer Utilization, and Teacher Attitudes and Volunteer Utilization, and Report No. 9: The Volunteers, this series, for further information on these interviews.

[2]See Report No. 8: The Peace Corps Educational Television Project in Colombia --- The Televised Curriculum and the Colombian Teacher, this series, for more information on teacher problems in using the Teacher Guides. However, at the time of planning the experiment, most of the teachers' complaints were relayed to us through utilization Volunteers.

[3]A.A. Lumsdaine, "Instruments and Media of Instruction," Handbook of Research in Teaching, N.L. Gage, ed., Rand McNally, Chicago, 1963.

[4]Michael, D.N., & Maccoby, N., "Factors Influencing Verbal Learning from Films Under Varying Conditions of Audience Participation," J. Exp. Psych., 1953, 46, 411-418; Maccoby, N., & Sheffield, F.D., "Combining Practice with Demonstration in Teaching Complex Sequences: Summary and Interpretation," Student Response in Programmed Instruction: A Symposium, A.A. Lumsdaine, ed., National Academy of Sciences-National Research Council, Wash., D.C., 1961.

[5]At the time of the experiment, and in previous reports, a different terminology was used for two of the conditions. Active Pupil Practice was called "Socratic," and Expository was called "Teacher Tell." The new terminology has been adopted because it is more descriptive of the actual behavior of the teachers and students.

[6]The representative of the Colombian Ministry of Education was Elsie Leguizamon; television teachers and Guide writers who provided considerable help were Beatrice Lopez, Inez Triana, and Enrique Amador; Volunteers who helped, either in the pre-testing of manipulations or test items, or in the experiment itself, included Ann Erdman, Rose Uyehara, Marcia Dittman, Peter Gyfteas, Dora Collazo, Bonnie Kosmack, Carolyn Rycyna, Lynn Bernard, and Pat Hummel.

[7]See Report No. 2, this series.

[8]The non-uniform observance of holidays by schools in Ibague forced the construction of parallel forms of the criterion test for two of the telecasts (one being seen by some schools, the other by other schools) for each subject. Pre-test results were used to choose items of equal difficulty; only one-eighth of the content of each test was involved.

[9]All the tests supervised by one Volunteer (six classes) and the tests of one class supervised by another Volunteer were lost in transit to the research office in Bogota. In the former case, a celadora (janitress) mistook the dog-eared exams for rubbish, and burned them; in the latter, they were simply lost enroute.

[10]McNemar, Quinn, Psychological Statistics, John Wiley & Sons, Inc. New York & London, 1962, chapter 7.

[11]Beeby, C.E., The Quality of Education in Developing Countries, Cambridge, Mass.: Harvard University Press, 1966, p. 109.

APPENDIX

The written instructions provided teachers assigned to the Active Practice condition:

Su clase ha sido seleccionada para participar en el programa de investigación de Stanford-Cuerpo de Paz. Esperamos que Ud. cooperará trabajando con nosotros en el perfeccionamiento de la Educación para los Estudiantes Colombianos.

Es de primordial importancia que para el buen éxito del programa, sigan las instrucciones indicadas a continuación:

1. Unos 10 a 15 minutos antes de la teleclase deben dictarse las 5 primeras preguntas del cuestionario relacionado con el Discurso de Motivación, en la forma siguiente:

a) Lea a sus alumnos la primera pregunta en voz alta.

b) Haga que los estudiantes contesten la pregunta en sus cuadernos o en una hoja de papel.

c) Deles el tiempo suficiente (2 a 3 minutos) para que puedan contestar la pregunta y luego dicteles la respuesta correcta. No es necesario que los alumnos copien la pregunta o la respuesta dictada por el maestro en este tercer punto (c).

d) Dicte la siguiente pregunta siguiendo el mismo procedimiento indicado arriba, hasta completar las cinco primeras preguntas.

2. Después de estas cinco primeras preguntas se atenderá a la teleclase correspondiente a ese día.

3. Al terminar la teleclase debe dictarseles a los alumnos las últimas cinco preguntas, que aparacen en el Cuestionario correspondiente al discurso de Repaso, en la misma forma descrita arriba para las cinco preguntas del cuestionario -Motivación.

Two of the outlines provided Active Practice condition teachers for "motivation" and"follow-up" instruction, one for fourth grade Natural Science and one for fifth grade Mathematics:

Ciencias Naturales - IV

PRIMERA ETAPA -- MOTIVACIÓN

Instrucciones: Antes de comenzar la emisión televisada correspondiente al día de hoy, el profesor deberá hacer que sus alumnos contesten el siguiente cuestionario. Los estudiantes deberán escribir en sus cuadernos unicamente la respuesta.

1. Qué gas producen las plantas durante las horas de la nochê?

Respuesta: Gas Carbónico

2. Qué gas es necesario para que haya combustiones?

Respuesta: Oxigeno

3. Escriba el nombre de tres elementos combustibles.

Respuesta: Gasolina, carbón, petróleo, fósforo, etc.

4. Por que debemos tener cuidado con todos los elementos que arden facilmente?

Respuesta: Para evitar incendios

5. Por que no deben quemarse los territorios destinados a cultivos.

Respuesta: La tierra se esteriliza.

SEGUNDA ETAPA -- EMISION TELEVISADA

Los estudiantes atenderan a la clase televisada.

TERCERA ETAPA -- REPASO

Instrucciones: Después de cada una de las siguientes preguntas daré tres respuestás. Solamente una de las tres es verdadera. Uds. deberán escribir en sus cuadernos la respuesta que consideren verdadera.

1. Para que haya combustión se hace indispensable la presencia de:

a) Oxígeno b) Gas Carbónico c) Nitrógeno

2. El oxígeno es un gas:

a) Combustible b) Comburente c) Combinado

3. Un combustible puede ser:

a) El Agua b) El Cemento c) El Petróleo

4. Los incendios pueden ser causados por:

a) inundaciones b) Corto Circuitos c) Falta de Aire

5. En caso de incendio debemos:

a) Aumentar la corriente de aire para apagar el fuego

b) Permanecer inmóviles hasta que llegue los bomberos

c) Arrojar agua para extinguir las llamas

Matematicas V

PRIMERA ETAPA -- MOTIVACIÓN

Instrucciones: Antes de comenzar la emisión televisada haga que sus alumnos contesten el siguiente cuestionario. Es posible que la mayoría de ellos ignoren algunas de las preguntas que aparecen a continuación, sin embargo deberán intentar contestarlas.

1. Represente numéricamente . las siguientes cantidades:

a) Cuatro por ciento R= 4% b) Cincuenta por Ciento R= 50%

c) Ciento por Ciento R= 100%

2. Cuál es el cinco por ciento de 800?

Respuesta: $\frac{5}{100}$ 80 = $\frac{400}{100}$ = 4

3. Cuál es el treinta por ciento de 900?

Respuesta: $\frac{30}{100}$ 900 = $\frac{27000}{100}$ = 270

4. Cuál es el cincuenta por ciento de 1.000?

Respuesta: 1.000 ÷ 2 =500

5. Cuál es el veinte por ciento de 500?

Respuesta: $\frac{500}{5}$ = 100

SEGUNDA ETAPA -- EMISION TELEVISADA

Los estudiantes atenderan a la clase televisada.

TERCERA ETAPA - REPASO

1. a) El 50% de 300 equivale a _____R= 150

   b) El 50% de 900 equivale a _____R= 450

2. a) 1/4 de 100 corresponde al ____%. R= 25%

   b) 1/5 de 100 corresponde al ____%. R= 20%

3. a) El 10% de 450 es equivalente a ____R= 45

   b) El 10% de 1.500 es equivalente a ____R= 150

4. El 100% de una caja de lápices de 592 es = _____.

   R= 592 lápices o unidades.

5. a) El 25% de 800 es equivalente a _____R= 200

   b) El 20% de 400 es equivalente a ____R= 80

The written instructions provided teachers assigned to the Expository condition:

Su clase ha sido seleccionada para participar en el programa de investigación de Stanford-Cuerpo de Paz. Esperamos que cooperará trabajando con nosotros en el perfeccionamiento de la Educación para los Estudiantes Colombianos.

Es de primordial importancia que para el buen éxito del programa, sigan las instrucciones indicadas a continuación:

1. Unos 10 a 15 minutos antes de la teleclase Ud. debera´ leer el Discurso de Motivación, este es una introducción a la clase que vendra´ a continuación. Durante esta presentación de ninguna manera se les exigera´ a los estudiantes responder o participar.

2. Habiendo llevado a efecto el punto anterior se atendera´ a la clase televisada.

3. Después de la teleclase la maestra leera´ el Discurso de Repaso en la misma forma que leyó el de Motivacion. No se les exigera´ a los estudiantes responder o participar.

Two of the outlines provided Expository condition teachers for "motivation" and "follow-up" instruction, one for fourth grade Natural Science and one for fifth grade Mathematics:

Ciencias Naturales IV

PRIMERA ETAPA -- MOTIVACIÓN

Recordemos un poco las características del oxígeno y su importancia para la vida del hombre y de los seres vivos en general. Vimos en la clase pasada que las plantas durante el día producen abundancia de oxigeno para que los demas seres vivos que tienen respiración pulmonar se aprovechen de él y puedan vivir. También aprendimos que el gas llamado oxígeno es indispensable para que haya combustión. Es decir para que se produzca calor, energias, fuego, etc.

Para que el fuego se pueda producir es necesario la presencia de dos elementos uno Comburente que es el oxígeno y otro combustible que puede ser la gasolina, el alcohol, etc.

Hoy tendremos pues una clase muy interesante donde se nos explicarán las precauciónes necesarias para evitar los accidentes producidos por el fuego; conoceremos además algunos materiales combustibles sus usos y peligros a que nos exponen.

SEGUNDA ETAPA -- EMISION TELEVISADA

Los estudiantes atenderán a la clase televisada.

TERCERA ETAPA -- REPASO

Hemos observado que para que haya combustion es necesaria la presencia del oxígeno, sinembargo podemos observar una diferencia entre los elementos que toman parte en la combustión. Uno se llama Comburente o sea el oxígeno y el otro es el Combustible. Hay gran número de combustibles o sean materiales o substancias que arden. Entre ellos encontramos elalcohol la gasolina, el petróleo, el carbón, la leña, el fosforo, etc.

El fuego es muy util al hombre pero también puede ocasionarle graves danos tanto en sus bienes como en su misma persona. Las quemaduras pueden ser leves o muy serias, tanto que produzcan la muerte del individuo. Por esto es prudente mantener aislados de los lugares residenciales las bombas de gasolina, depósitos de petróleo y gases combustibles.

También se recomienda emplear materiales no inflamables en las construcciones y tener cuidado con las instalaciones eléctricas y del gas para que no se produzcan cortos o escapes que puedan resultar peligrosos. Los cuidados en el uso de artefactos eléctricos como planchas, reverberos y otros elementos como lámparas de petróleo, estufas, velas, cigarrillos, etc. han producido un alto numéro de catástrofes que de tener más cuidado se hubieran evitado.

En el caso de encontrarnos frente a un incendio, debemos procurar no perder la calma y obrar con rapidéz, extinguir o apagar el fuego con grandes cantidades de agua. En caso de que el fuego persista debe llamarse inmediatamente a los bomberos. El panico causa a veces más muertes que el mismo incendio.

La costumbre de prender fuego a los terrenos de cultivo no es recomendable ya que al quemar la tierra ésta se empobrece y pierde gran cantidad de los elementos que la hacen fértil y productiva.

Matematicas V

PRIMERA ETAPA -- MOTIVACION

Recuerden que en la clase pasada aprendimos a obtener el tanto por ciento o porcentaje utilizando la multiplicación de un entero por un fraccionario. Así presentamos algunos ejercicios como éste: Cuáles el 3% de $80? Encontramos que el resultado es $2.40.

Hoy estudiaremos algunos casos especiales de porcentaje. Por ejemplo, ya sabemos que un metro tiene 100 cms, que el 50% de 100 cms. es por tanto 50 cms. lo que equivale a decir que es igual a la mitad del metro. Generalizando podríamos decir que el 50% de cualquier cantidad es igual a la mitad de ésta. Este es apenas uno de los varios casos especiales que se presentan en la obtención de porcentajes así que la clase de hoy será de gran interés ya que nos enseña como obtener porcentajes en una forma simplificada y más rápida.

SEGUNDA ETAPA -- EMISION TELEVISADA

Ahora los estudiantes atenderán a la emisión televisada.

TERCERA ETAPA -- REPASO

Como pudimos apreciar en la teleclase hay algunos casos

especiales en la obtencion de los porcentajes que hacen mas faciles y rapidas las operaciones.

Recordemos algunos de los conceptos aprendidos el dia de hoy: Tomando como medida general el metro que tiene 100 cms. podemos decir:

a) El 100 por 100 de una cantidad es el total de la misma.

Ej.: El 100% de 50 es 50, el de 245 es 245, el de 850 es 850, etc.

b) El 50% de una cantidad corresponde a la mitad de la misma.

El 50% de 80 sera 40, el de 60 sera 30, el de 30 sera 15, etc.

c) El 25% de una cantidad corresponde a 1/4 de la misma.

Ej.: El 25% de 100 es 25, el de 80 es 20, el de 60 es 40,etc.

d) El 20% de una cantidad corresponde a 1/5 de la misma.

Ej.: El 20% de 100 es 20, el de 50 es 10, el de 125 es 25,etc.

e) El 10% de una cantidad corresponde a 1/10 de la misma.

Ej.: El 10% de 100 es 10, el de 30 es 3, el de 60 es 6, etc.

Esta forma de obtener el porcentaje facilita las operaciones y nos permite obtener resultados mas rapidamente. Asi si nos preguntan a cuanto corresponde el 50% de los alumnos de una escuela de 250 estudiantes, rapidamente podemos decir que 1/2 de 250 es 125. En igual forma si nos preguntan el 20% de 800 alumnos sabriamos que 1/5 de 800 es = 160, etc. Para obtener una mejor comprension observemos el caso que escribire en el tablero.

El 25% o 1/4 de 500 = 500 $\div$ 4 = 125

Reports In This Series

This series supplants all previous reports on the two years of research conducted on the Peace Corps Educational Television Project in Colombia. There are 12 volumes -- 10 research reports, each dealing with a different aspect of the project, plus An Introduction, concerned with the organization and conduct of the research, and a concluding Overview, containing a summary of the major findings and some general observations on the project.

The title of the series: The Peace Corps Educational Television Project in Colombia -- Two Years of Research.

The individual volumes:

An Introduction to Research Reports No. 1-10.

Report No. 1: The Project as a Whole -- Organization, Expansion, and Adaptation.

Report No. 2: The Project's First Semester -- Pupil Achievement, Teacher Attitudes, and the Work of the Utilization Volunteer.

Report No. 3: Improving the Effectiveness of the Utilization Volunteer and the Utilization of ETV by the Colombian Teacher.

Report No. 4: The Colombian Teacher and the Utilization Volunteer -- Making ETV Work in the Schools of a Developing Country.

Report No. 5: The Day-to-Day Job of the Utilization Volunteer -- Structure, Problems, and Solutions.

Report No. 6: Instructional Television for the In-Service Training of the Colombian Teacher.

Report No. 7: Improving the Effectiveness of Peace Corps Efforts to Change Teacher Behavior.

Report No. 8: The Televised Curriculum and the Colombian Teacher.

Report No. 9: The Volunteers.

Report No. 10: Feedback to the Peace Corps on Project Progress -- Some Models and Suggestion.

An Overview of Research Reports No. 1-10.

BRIEF FACTS

The ETV Project: In 1963, the Peace Corps, with the financial support of the Agency for International Development (AID), agreed to help the Colombian government establish a nationwide educational television (ETV) system directed primarily at improving public education. The initial Peace Corps goal was to provide televised instruction for primary school pupils and their teachers. It was hoped that eventually the system could also provide instruction for adults in literacy, health, agriculture, and topics of general interest, and for students beyond the primary grades. The ultimate Peace Corps goal is to establish an ETV system operated independently by Colombia. The project was inaugurated in Colombia at the beginning of 1964. It has had two major concerns in achieving its initial goal: the production of televised courses, and the building of a receiving network of schools with television in which teachers would build their own teaching around the instructional "core" provided by the telecasts. During the project's first three years (1964-1966), the number of Volunteers assigned to the project by the Peace Corps who have worked closely with Colombians toward these goals has ranged from 66 to 88. Of these, about half a dozen have been concerned with the installation and maintenance of TV sets in schools, between slightly more than half to two-thirds working with teachers in schools on making ETV more effective, and the rest with the production of telecasts. During the first year, 10 courses were telecast for pupils, each consisting of two 15 minute telecasts a week, for a weekly total of 300 minutes, exclusive of repeated programs; during 1965 and 1966, 15 such courses were telecast, for a weekly total of 450 minutes exclusive of repeated programs. In addition, individual programs and short courses have been telecast for teachers. When telecasting began in February, 1964, the receiving network encompassed approximately 200 schools, 1,000 teachers, and 38,000 pupils; by the end of 1964, 500 schools, 4,025 teachers, and 153,000 pupils; by the end of 1965, 925 schools, 7,000 teachers, and 260,000 pupils; and by the end of this year, 1,250 schools, 8,500 teachers, and 350,000 pupils. Telecasting has been over the open network of the Instituto de Radio y Television, a semi-government agency which telecasts commercially in the evenings, and which also has provided studio facilities for ETV. To achieve its ultimate goal, the Peace Corps has been concerned with building a permanent, financially viable, and competent organization to assume the Volunteers' functions. At present, Peace Corps participation is planned to continue up to the middle of 1968. For more on the ETV Project itself, see Report No. 1: The Project as a Whole -- Organization, Expansion, and Adaptation, this series.

The Research: Because Colombia was the first country in which the Peace Corps undertook an educational television (ETV) project, it decided to provide for close, thorough, and continuing research, and late in 1963 contracted with Stanford University's Institute for Communication Research. The Institute maintained a staff in Colombia actively engaged in research for the first two years of the ETV Project, from January, 1964, through January, 1966. The titles of the final series of reports on its studies appear on the previous page. For more on the research as a whole, see An Introduction to Reports No. 1-10, this series.